

What is claimed is:

1. A heat sink hand placement tool, comprising:
  - a heat sink interface block having a lower surface adapted to provide a force on a heat sink disposed over an integrated circuit (IC);
  - 5 a force transducer interfacing with an upper surface of said heat sink interface block for producing an electrical signal;
  - a measurement circuit for measuring said electrical signal; and
  - a chassis disposed over said force transducer and said measurement circuit, wherein said chassis is adapted to receive a force from a user, said
  - 10 force being transmitted to said lower surface of said heat sink interface block, and said measurement circuit provides an indication of said force being within a predetermined range.
2. The tool of claim 1 further comprising an extension rod having a first end
- 15 coupled to said upper surface of said heat sink interface block and a second end coupled to said force transducer.
3. The tool of claim 2 wherein said force transducer comprises:
  - a cantilever beam interfacing with said second end of said extension rod;
  - 20 at least one strain gauge coupled to said cantilever for producing said electrical signal in response to said cantilever beam deflecting from said force.
4. The tool of claim 3, wherein said force transducer further comprises:
  - a mounting member;
  - 25 said cantilever beam having a first end and a second end, said first end flexibly coupled to said mounting member; and
  - said at least one strain gauge comprises a pair of strain gauges, each strain gauge respectively attached on opposing sides of the first end of said cantilever beam proximate said mounting member.
  - 30
5. The tool of claim 4, wherein the second end of said cantilever beam is U-shaped and circumscribes a portion of the second end of said extension rod.

6. The tool of claim 5, wherein the second end of said cantilever comprises:  
a pair of tongs circumscribing said portion of the second end of said  
extension rod; and  
a retainer pin extending through said pair of tongs and the second end of  
5 the extension rod, thereby forming a pin joint therebetween.
7. The tool of claim 6, wherein said the pin joint allows a transmission of  
torque applied at the chassis to the heat sink interface block, via the extension  
rod.
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8. The tool of claim 4 wherein said measurement circuit comprises:  
a wheatstone bridge, wherein said pair of strain gauges form a pair of  
resistors of said wheatstone bridge; and  
at least one comparing circuit coupled to an output of said wheatstone  
15 bridge, said at least one comparing circuit respectively producing an output that  
changes state in response to an output voltage of said wheatstone bridge  
exceeding a predetermined threshold level of said at least one comparing  
circuit.
- 20 9. The tool of claim 8, further comprising an amplifier coupled between said  
output of said Wheatstone bridge and an input of said at least one comparing  
circuit.
10. The tool of claim 8, wherein said at least one comparing circuit provides  
25 a signal to a respective at least one light emitting diode (LED) mounted on said  
chassis that corresponding to said indication of said force being within a  
predetermined range.
11. The tool of claim 10, wherein said at least one comparing circuit  
30 comprises a first and second comparator;  
said first comparator providing a first signal to a first LED indicating that  
an applied force is greater a minimum pressure; and

said second comparator providing a second signal to a second LED indicating that said applied force is greater than a maximum pressure.

12. The tool of claim 11, wherein said minimum pressure is approximately  
5 five pounds of pressure per square inch, and said maximum pressure is approximately eight pounds of pressure per square inch.

13. The tool of claim 11, wherein said at least one comparing circuit comprises a third comparator, said third comparator providing a third signal to a  
10 third LED indicating that a power source of said tool is below a predetermined threshold.

14. The tool of claim 10, further comprising a control circuit coupled to said measurement circuit for switching said measurement circuitry on when applying  
15 a force.

15. The tool of claim 14, wherein said control circuit comprises:  
a clock;  
a first counter having an input and a plurality of outputs, said clock  
20 coupled to the input of said counter;  
an eight-bit AND gate respectively coupled to eight outputs of the plurality of outputs of said second counter; and  
a switch coupled to said power source, wherein said eight-bit AND gate comprises a first output, which represents eight bits from the first counter, is  
25 coupled to said switch for turning said switch on and off.

16. The tool of claim 15, wherein in an instance where the output of the eight-bit AND gate is in a high state, said switch is turned on.

30 17. The tool of claim 15, wherein said first counter provides a ninth bit to said eight-bit AND gate; and

a second output of said eight-bit AND gate, which represents the nine bits from said counter, respectively coupled to a clock input of said at least one flip-flop.

5 18. The tool of claim 17, wherein in an instance where said second output of said eight-bit AND gate is in a high state, said at least one flip-flop is set, thereby respectively turning on said at least one LED.

19. The tool of claim 17, wherein said control circuit comprises:  
10 a second counter coupled to said clock; and  
a force duration LED coupled to said second counter, wherein said second counter turns on said force duration LED in response to said output voltage of said wheatstone bridge exceeding said predetermined voltage threshold setting of said at least one comparing circuit for a predetermined  
15 duration.